In the Claims:

1. (Currently Amended) A natural language processing apparatus for translating natural language into a formal language executable on a programmable device, said system comprising,

a) memory for storing data;

b) a data processor;

c) an input device for presenting natural language text to said system:

d) a text parser for partitioning said text into a sequence [[pf]] of sequences of strings of characters or pretokens;

e) a lexicon for storing lexical terms as token associated with lexical type and reference data;

f) a lexical type assignment process for assigning lexical types to pretokens by comparison to terms in the lexicon;

g) a lexical insertion processor for inserting terms into the lexicon under specific control;

h) a control processor for invoking lexical insertions under the condition that a pretoken is not recognized as a lexical token;

i) a type contextualization processor by which refined lexical types may be reassigned to tokens depending on syntactic context;

j) a type reduction matrix;

k) a term reduction processor which uses said type reduction matrix to determine proper syntactic dependencies between tokens in a sentence;

l) a term inversion processor for constructing chains of syntactic dependencies among lexical terms in an expression and for determining [[the]] proper dependencies between those chains;

m) a syntactic tree generation processor for constructing syntactic trees representing the syntactic structure of each ~~processed~~ expression processed by the processors;

n) a syntactic algebra comprising syntactic terms formally representing processed expressions;

o) a syntactic representation processor for constructing syntactic terms to represent [[the]] formal syntactic ~~structure~~ structures of processed expressions;

p) a semantic algebra comprising semantic objects as formal references of appropriate terms in the syntactic algebra;

q) a semantic representation processor for associating internal semantic object references with terms in the syntactic algebra;

r) a semantic tensor algebra comprising correlated pairs of syntactic algebraic terms and their semantic object representations;

s) a formal representation processor for associating appropriate internal formal models with terms in the semantic tensor algebra;

t) a formal interpretation processor for transforming terms in the syntactic algebra into equivalent expressions in an internal formal language;

u) an external representation processor for associating external operational environments with internal formal models;

v) an external interpretation processor for translating expressions ~~in an internal~~ in an internal formal language into equivalent formal expressions executable into appropriate external operational environments.

2. (Currently Amended) A method for translating natural language into a formal language executable on a programmable device, said method comprising the steps of:

a) receiving natural language text;

b) parsing said text into a sequences of sequences of pretokens;

c) recognizing pretokens as tokens in the lexicon;

b) parsing said text into a sequence of sequences of pretokens;

c) recognizing pretokens as tokens in the lexicon;

d) inserting new terms into the lexicon under specific control;

e) assigning types to pretokens to form lexical terms for further syntactic processing;

f) reassigning lexical types to tokens based on syntactic context;

g) correlating terms occurring in a set of expressions in order to replace indirect references by appropriate direct references;

h) establishing syntactic dependencies between terms in an expression through a process of term reduction;

i) constructing chains of syntactic dependencies and determining dependencies between those chains, by a process of term inversion;

j) generating syntactic trees which represent the syntactic structures of [[said]] processed expressions;

k) representing said processed expressions as terms in a syntactic algebra;

l) representing terms in the syntactic algebra as objects in [[the]] a semantic algebra;

m) combing objects in the semantic algebra by means of a semantic product on pairs of semantic objects to form more complex semantic objects;

n) representing correlated syntactic algebraic terms and semantic objects as terms in a semantic tensor algebra;

o) representing terms in the semantic tensor algebra as internal formal models;

p) transforming terms in the syntactic algebra into equivalent expressions in an internal formal language,

q) associating external operation environments with internal formal models; and

p) translating expressions of the internal formal language into equivalent formal expressions executable in an external operational environment.

3. (Currently Amended) In a natural language processing apparatus for translating natural language into a formal language

executable on a programmable device, wherein said ~~system~~ apparatus includes processing means; input means for presenting natural language text to said system;

a lexicon of terms; a text parser which partitions expressions into sequences of sequences of pretokens;

a type assignment process for assigning syntactic types to pretokens by comparison to lexical terms in the lexicon and determining their status as tokens;

a type contextualization process for reassigning lexical types to tokens based on syntactic context,

a term correlation process for correlating terms occurring in a set of expressions in order to replace indirect references by direct references, said system comprising

a) a type reduction matrix;

b) a term reduction processor that uses the type reduction matrix to determine proper syntactic dependencies between tokens in an expression;

c) a term inversion processor for constructing chains of syntactic dependencies among lexical terms in an expression and for determining the proper dependencies between those chains;

d) a syntactic tree generation processor for constructing syntactic trees representing [[the]] syntactic structures of expressions;

e) a syntactic algebra comprising syntactic terms formally representing processed expressions;

f) a syntactic representation processor for constructing syntactic algebraic terms representing processed expressions;

g) a semantic object algebra comprising semantic objects as internal references of terms in the syntactic algebra;

h) a semantic product processor by which objects in the in the semantic object algebra are combined to form more complex semantic objects;

i) a semantic representation processor by which internal semantic algebraic objects representing terms in the syntactic algebra are constructed;

j) a semantic tensor algebra comprising correlated syntactic terms and semantic objects;

k) a formal representation processor by which internal formal models are associated with terms in the semantic tensor algebra;

l) a formal interpretation processor by which syntactic algebraic terms are transformed into equivalent expressions in an internal formal language;

m) a semantic product processor by which objects in [[the]] semantic algebra are combined to form more complex semantic objects;

n) an external representation processor by which external operational environments are associated with internal formal models; and

o) an external interpretation processor by which expressions in an internal formal language are translated into equivalent formal expressions executable in an external environment;

4. (Currently Amended) A software system for translating natural language into a formal language executable on a programmable device,

wherein said system includes processing means; input means for presenting natural language text to said system; a lexicon of terms; a text parser which partitions natural language texts into sequences of sequences of pretokens; a type assignment process for assigning syntactic types to pretokens by comparison to lexical terms in the lexicon and determining their status as tokens;

a type contextualization process for reassigning lexical types to tokens based on syntactic context;

a term correlation process for correlating terms occurring in a set of expressions in order to replace indirect references by direct references,

a) a type reduction matrix;

b) a term reduction process which uses the reduction matrix to determine proper syntactic dependencies between tokens in an expression;

c) a term inversion process for constructing chains of syntactic dependencies among lexical terms in an expression and for determining the proper dependencies between those chains;

d) a syntactic tree generation process by which syntactic trees representing [[the]] syntactic structures of expressions are constructed;

e) a syntactic algebra comprising syntactic terms formally representing processed expressions;

f) a syntactic representation process by which syntactic algebraic terms representing processed expressions are constructed;

g) a semantic object algebra comprising semantic objects as internal references of term in the syntactic algebra;

h) a semantic object algebra comprising semantic objects as formal references of terms in the syntactic algebra;

i) a semantic representation process by which internal semantic algebraic objects representing appropriate terms in the syntactic algebra are constructed;

j) a semantic product process by which objects in the semantic algebra are combined to form more complex semantic objects;

k) a formal representation process by which internal formal models object references are associated with terms in [[the]] semantic tensor algebra;

[[j]] l) a formal interpretation process by which syntactic algebraic terms are transformed into equivalent expressions in an internal formal language;

[[l]] m) an external representation process by which appropriate external operation environments are associated with internal formal models; and

[[l]] n) an external interpretation process by which expressions in an internal formal language are translated into equivalent formal expressions executable in an external operational environment.

5. (Currently Amended) A software system for a data processing device used in translating natural language into executable expressions in a formal language,

wherein said data processing device includes a data processor and memory;

input means for presenting natural language text to said system; a lexicon of terms; a text parser which partitions natural language texts into sequences of sequences of pretokens;

a type assignment processor for assigning syntactic types to pretokens by comparison to lexical terms in the lexicon and determining their status as tokens;

a type contextualization processor for reassigning lexical types to tokens based on syntactic context;

a term correlation processor for correlating terms occurring in a set of expressions in order to replace indirect references by direct references; said software system comprising,

a) a type reduction matrix for processing said expressions;

b) a term reduction processor that uses the type reduction matrix to determine proper syntactic dependencies between tokens in an expression;

c) a term inversion processor for constructing chains of syntactic dependencies among lexical terms in an expression and for determining the proper dependencies between those chains;

d) a syntactic tree generation processor by which syntactic trees representing [[the]] syntactic structures of expressions are constructed;

e) a syntactic algebra comprising syntactic terms formally representing said processed expressions;

f) a syntactic representation processor by means of which syntactic algebraic terms representing processed expressions are constructed;

g) a semantic object algebra comprising semantic objects as internal references of terms in the syntactic algebra;

h) a semantic representation processor by which internal semantic algebraic objects representing terms in the syntactic algebra are constructed;

i) a semantic product processor by which objects in [[the]] semantic algebra are combined to form more complex semantic objects;

j) a formal representation processor by which internal formal models are associated with terms in [[the]] semantic tensor algebra;

k) a formal interpretation processor by which syntactic algebraic terms are transformed into equivalent expressions in an internal formal language;

l) an external representation processor by which external operational environments are associated with internal formal models; and

m) an external interpretation processor by which expressions in an internal formal language are translated into equivalent formal expressions executable in an external operational environment.

6. (Currently Amended) A system as in claim 5 further including a protocol for connecting [[the]] an output of said translating processor to digitally responsive machines and other data responsive devices.

7. (Currently Amended) A system as in claim 5 further including a protocol by means of which

a-2) [[a)]] selected ones of said internal formal models are associated with terms in said semantic tensor algebra;

b-2) [[b)]] syntactic algebraic terms are transformed into equivalent expressions in the internal formal language;

c-2) [[c)]] selected external operational environments are associated with selected formal models; and

d-2) [[d)]] expressions in the internal formal language are translated into equivalent formal expressions executable in an external operational environment.

8. (Currently Amended) A system as in claim 5 further comprising,

a-3) [[a)]] a lexical insertion processor for inserting lexical terms into the lexicon under user control whereby said lexicon can be expanded and refined; and

b-3) [[b)]] a controller for invoking lexical insertions under the condition that a pretoken is not recognized as a lexical token.

9. (Original) A system as in claim 7 further including a process control for inserting external lexical information to said lexicon to enable the system to learn new lexical information including vocabulary and associated lexical type and reference relations.

10. (Original) A data processing system for translating a natural language into a language executable as a formal machine language comprising, in combination,

a) input devices for inputting a natural language text to said system;

b) text processing components for providing an output comprising a sequence of pre-expressions based on said text;

c) a syntactic processing component receiving said pre-expressions and providing a sequence of syntactic complexes;

d) semantic processing components for receiving said sequence of syntactic complexes and providing a sequences of formal expressions; and

e) external processing components for providing a sequence of executable expressions to an external operational environment based on said formal expressions.

11. (Original) A method of translating a natural language into a language executable as a formal or machine language comprising the steps of,

a) inputting a natural language text to a data processing system;

b) providing an output comprising a sequence of pre-expressions based on said text;

c) receiving said pre-expressions and providing a sequence of syntactic complexes; d) receiving said sequence of syntactic complexes and providing a sequences of formal expressions; and

e) providing a sequence of executable expressions as an external operational structure based on said formal expressions.